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Imaging Radioactive Sources using Autoradiography

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LA-UR-XXXXXX

Summer Fun



Kevin Glennon (C-NR)

- Education
 - B.S Chemistry; University of Arkansas, 2015
 - PhD candidate in chemistry, Texas A&M
- Chemistry Division
 - Nuclear and Radiochemistry
 - Nuclear Chemistry team
 - Evelyn Bond
- Research
 - LANL: Imaging radioactive sources using autoradiography
 - Texas A&M: Developing new forensic techniques for the discrimination of separated Pu

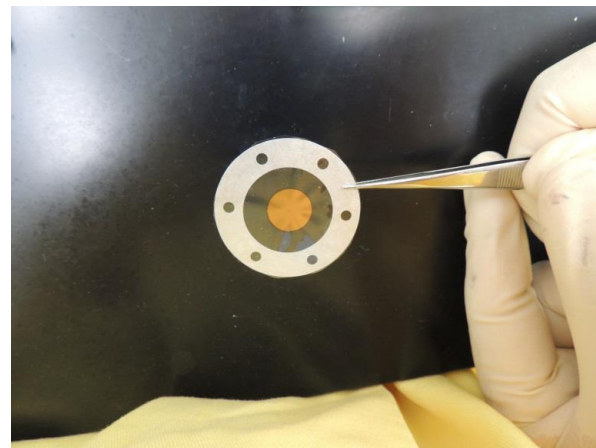


Research Overview and Motivation

- Nuclear reactions are often performed by irradiating a stationary target nucleus with neutrons or an accelerated projectile nucleus

$$R = \sigma N_a \phi$$

- These targets are typically prepared by depositing material on thin metal, Mylar, or graphite foils
 - Electrodeposition
 - Evaporators
 - Chemical vapor deposition



Research Approach

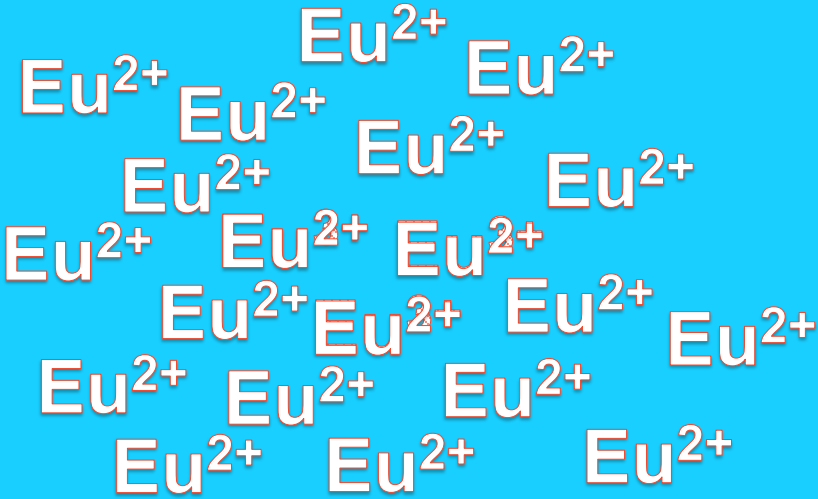
- Producing uniform targets is important for the success of a reaction
 - Cracked, rough, or irregular targets may waste beam
- The uniformity of a radioactive target may be assayed using autoradiography
 - Modern techniques use a photostimulated luminescent BaFBr:Eu²⁺ phosphor

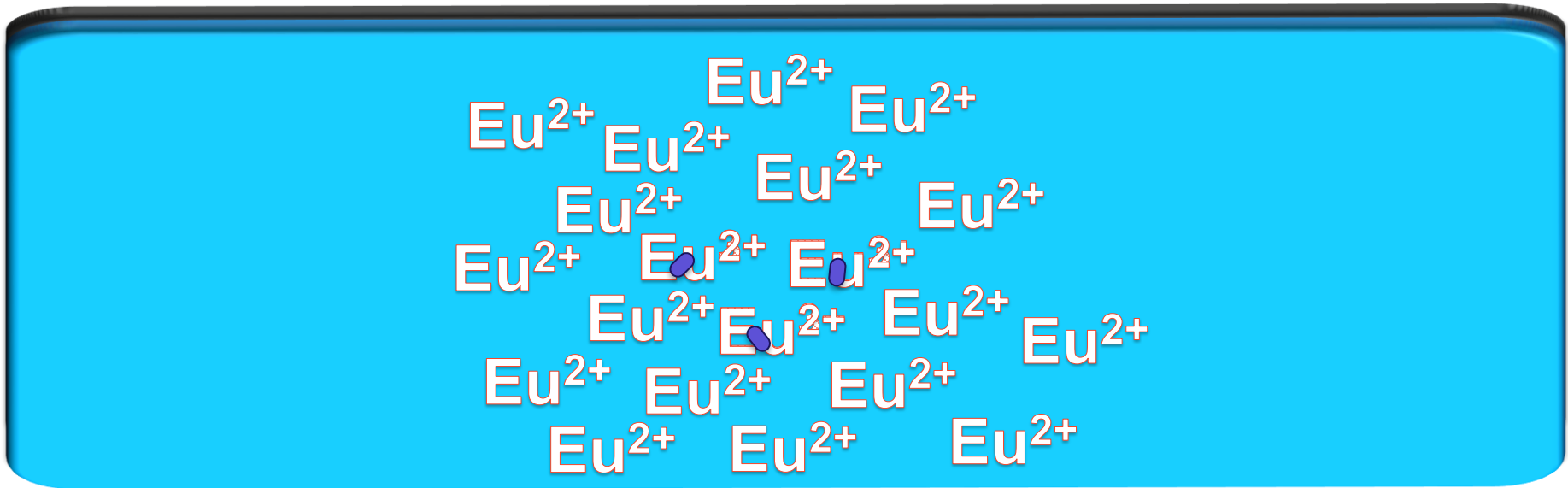
$$O.D. = kE$$

$$E = Q * \Delta N$$

$$A = \frac{\Delta N}{t} = \frac{E/Q}{t}$$

$$A = \frac{O.D.}{k * Q * t}$$





Summary of Results

